Astronomy in Mithilā

(10th century A.D. to 15th century)

Parmeshwar Jha

Mithilā has been the centre of Sanskrit learning since time immemorial. It was for long a seat of Vedic and Upaniṣadic studies. Notable contributions to different branches of knowledge have been made by the great scholars of the land. Several attempts have been made in the past to take stock of philosophical and allied literature of Mithilā, but a very few efforts have been made to bring to light its astronomical literature.[1] The aim of this paper is to present before the reading public a comprehensive account of the literary output of Mithilā in the discipline of Jyotiṣa during the period ranging from the 10th century A.D. to 15th century.

Mithilā has been the land of yajñas. For the performance of yajñas and religious rites it is very essential to have the knowledge of exact time (muhūrta) and positions of different planets. Religious practices and observances also require a correct knowledge of times of risings and settings of the sun and the moon and of the occurrences of solar and lunar eclipses. Accurate calculation of time, motion of planets, prediction of eclipses etc. are some of the important aspects of Jyotiṣa and as such, religious affairs of Maithilas are in various ways connected with Jyotiṣa. Moreover, Jyotiṣa is supposed to be the most important of all the six aṅgus (auxiliary situdies) of the Vedas[2] and hence for the

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1 Bihar Research Society, Patna has done a commendable work in this direction. The search for Sanskrit Mss in Bihar and Orissa was undertaken by the Society in 1918 and a Descriptive Catalogue of Mss in Mithilā was published in four volumes, out of which Vol. III contains Jyotiṣśāstra Mss which are rich and varied and are 437 in number.

2 यथा शिखा मयूराणां नागानां मणयो यथा ।
तद्वेदाङ्ग शास्त्राणां गणितं (ज्योतिषं) मूर्धनि स्थितम् ॥
—Vedāṅga Jyotiṣa, edited by Dr. R. Shamsastri, 1926, Mysore, Śloka–4,

correct interpretation of the Vedas it is essential to have the good knowledge of astronomy. As Mithilā has been the seat of Vedic studies from very early times, there must have been the tradition for studying the twin disciplines of astronomy and mathematics. The first glimpse of science of astronomy in the land is believed to have been found in the works of Yājñavalkya (c. 2000 B.C.), a contemporary of emperor Videha of Mithilā. A number of astronomical elements and constants have been used by him in his renowned works, viz, Yājñavalkya Smṛti[3] and Śatapatha Brāhmaṇa[4]. Thus it seems that the discipline of astronomy developed in Mithilā at least with Yājñavalkya. Since then Jyotiṣa has remained a favourite subject for Maithila scholars. A long list of writers as well as the works on Jyotiṣa is available. The wealth of material as found in Mithilā during the period under consideration is presented as far as possible, in a chronological manner in the following pages.

Dāka

Dāka or Ghāgha is famous in the whole of north India for his astronomical Vākyas. He is supposed to have lived in the 10th century A.D. or a bit earlier. These are sufficient grounds to believe that Dāka belongs to Mithilā[5]. It has been shown that Dāka has written his Vākyas in Maithilī (Avahaṭṭa) and a number of latter Maithila scholars, viz, Caṇḍeśvara, Harapati Ṭhākura, Mahārājādhirāja Śubhaṅkara Ṭhākura and others have quoted him as an authority on astronomy.[6] Whether Dāka has written a separate treatise on astronomy is not definite, but from the studies of his Vākyas it is clear that he is a notable scholar on Phalita Jyotiṣa. It is believed that his works are based on some of the old Jyotiṣa works, viz., Kaśyapa Saṁhitā, Nārada Saṁhitā and Muhūrta-cintāmaṇi. A number of Vākyas

3 I. 217-18.

4 IX. I. I. 43 & XII.8.2.33 and for details see P. V. Kane, History of Dharmaśāstra, vol. V, 1958, Poona. pp. 244-46, 489-507 and also Dr. S. Prakash, Founders of Sciences of Ancient India, 1965, Delhi, pp. 77-78 & 99-100 and S. B. Dikshit, Bhāratīya Jyotiṣa, 1963, Lucknow, pp. 150-52 & 180-81.

5 Cf. Pt. Jivanand Thakur, Maithila Dāka, 1949, Darabhangā, Preface.

6 Ibid, pp. 4-5 & 13.

relating to different aspects of astronomy are ascribed to him.[7] These Vākyas are found to be in connection with Rāśi, Muhūrta, Siddhiyoga, Dagdha tithi, Ariṣṭa, Candra-Vicāra Nindita yoga, Tārā Vicāra, Candra-phala, Yātrā, Grahaṇa, Gṛhastha Dharma, etc. These are found to be useful in day-to-day workings and hence are very popular, even these days, among the rural masses of Mithilā.

Ballālasena

Ballālasena, son of Lakṣmaṇa sena and Mahārājādhirāja of Mithilā (whose reign was established in Śaka 1082) composed astronomical treatise namely Adbhuta Sāgara just after eight years of his coronation i.e., in Śaka 1090 or 1168 A.D. This work is supposed to be the first available work on astronomy in Mithilā and has been very much popular since its composition.[8] It is a Muhūrta or Saṁhitā grantha and is based on Varāhamihira's Saṁhitā. Several astronomers and astronomical texts, viz., Garga, Parāsara, Kaśyapa Varāha Saṁhitā, Viṣṇu Dharmottara, Matsya Purāṇa, Bhāgavata, Brahmagupta Sūrya-Siddhānta, Viṣṇu Candra and Prabhākara have been quoted by him in this work. His description of several heavenly events make us believe that he was not only an author but also an observer of stars and planets.

Caṇḍeśvarācārya

In is believed that Caṇḍeśvarācārya lived in the time of Narasiṁhadeva (son of Gaṅgadeva and throned in 1181 A.D.) of Karṇāṭa dynasty. He was an erudite scholar of his age. He has written a book on astronomy namely Sūrya-Siddhānta-Bhāṣya[9] which is a commentary on a famous astronomical treatise Sūrya-Siddhānta. One copy of the manuscript of this work is still available in the Durbar library of Nepal. This copy is in Maithila character

7 Ibid & Dāka Vacana-Saṁgraha, published by Babu Raghubir Singh, Madhu;

8 This work has been first published in 1905 by Prabhakari, Benares. For details, cf. S. Dvivedi, Gaṇaka Taraṅgiṇī, 1933, Benares, pp. 42–44.

9 P. Jha, Mithilā Tattva-Vimarśa, I, 1949, Darbhangā pp. 115–116 and H. P. Śāstrī, a catalogue of Palm-leaf and selected paper Mss belonging to the Darbar Library Nepal, Vol. I, Calcutta, 1905, pp. 132–33.

and describes the commentator as a Maithila.[10] Caṇḍeśvarācārya has included the calculation of the Śaka year 1100 or 1178 A.D. in the work and hence he is supposed to be an astronomer of the 12th century.

Caṇḍeśvara Ṭhākura

Caṇḍeśvara Ṭhākura, Mahāmattaka, son of Vīreśvara Ṭhākura and grandson of Devāditya Ṭhākura was Sāndhi Vigrahika of Hari-Siṁhadeva (who reigned from 1307 A.D. to 1321 A.D.), the last great king of Karaṇāṭa dynasty.[11] He was one of the shining luminaries of the time and was a profound scholar of politics, Dharmaśāstra and astronomy. He has composed seven Ratnākaras on Dharmśāstra, viz, Kṛtya, Dāna, Vyavahāra, Śuddhi, Pūjā, Vivāda and Gṛhastha, one Ratnākara on politics namely Rājanīti Ratnākara-[12] and also an astronomical text namely Kṛtya-Cintāmaṇi which is supposed to be one of the best books on astronomy The manuscript of the last work is still available in the Sanskrit University, Darabhangā.[13]

Jyotirīśvara Ṭhākura

Varṇa-Ratnākara of Jyotirīśvara Ṭhākura, the earliest extant work in Maithilī vernacular is supposed to be written in the last quarter of the 13th century or the first quarter of the 14th century.[14] It is a compendium of life and culture in medieval India. It throws a flood of light on the cultural, literary and social aspects of Mithilā before 13th century A.D. The work gives us information about some of the famous astronomical treatises of the period. It is not definite whether Jyotirīśvara was himself an astronomer, but this much is evident that he was a man with 'a wholesome all-round interest in life.' Hence he included even some of the facts regarding Jyotiṣa in his monumental work. He draws our attention towards this branch of knowledge in the sub-

10 Ibid, p. 133, colophon.

11 cf. Dr. Upendra Thakur, History of Mithilā, 1956, Darabhangā, pp. 280-81.

12 This has been edited by Dr. K. P. Jayasawal and publised by Bihar Research Society, Patna in 1936.

13 Descriptive Catalogue of Rāja Mss. Darabhangā, 1969, p. 70, S. No. 1741.

14 Varṇa-Ratnākara, edited by S. K. Chatterjee and Babuaji Mishra & published by Royal Asiatic Society of Bengal, Calcutta, 1940, Intro., p. 10.

section Jyotiṣavid-Varṇana of the section Ṛtu Varṇana, the fourth chapter (caturtha Kallola) of the book. First of all he enumerates some of the Karaṇa granthas which were popular during his time and those are Mānasa Khaṇḍakhādyaka, Bhāsvatī, Tithicakra, Somaśekhara, Vidyādharī and Vilas.[15] Some of these texts are the works of great scholars of ancient time which are still supposed to be standard works on astronomy and some are still unknown to us. Mānasa (i.e. Laghu Mānasa) of Muñjāla (932 A.D.), Khaṇḍakhādyaka of Brahmagupta (598 A.D.) and Bhāsvatī (i.e. Bhāsvatī-karaṇa) of Śatānanda (c. 1099 A.D.) were popular among the Maithila scholars during the time of Jyotirīśvara and probably influenced the Jyotiṣa Siddhānta of Mithilā to a great extent.

Vidyādhara

Regarding Vidyādharī it may be said that it has been composed by a Maithila scholar Vidyādhara (Vijjāhara) who was a veteran secretary of Jayacandra (1170–1189). It is also said that he was the Royal Paṇḍita of Narasingh I and II of Gaṅga Dynasty.[16] Thus it may be inferred that Vidyādhara was a scholar of the 12th century. As he was a great scholar, he was called as sarvādhikārabhāradhurandhara and caturdaśa Vidyādhara[17]. One of his important works is Ekāvalī which is related to Kāvya Śāstra. It is just possible that he might have written an astronomical text which was named as Vidyādharī. This work was popular in Mithilā during the time of Jyotirīśvara but on account of ravages of time it was lost or damaged and hence is not available these days. Similarly other three books, viz., Tinhicakra, Somaśekhara and Vilas might have been written by Maithila scholars as no history on astronomy refers to these texts and Jyotirīśavara having mentioned them has informed that these were popular in Mithilā during his time.

15 Ibid, p. 23, मानस खण्डखाद्य भास्वती, तिथिचक्र, सोमशेखर, विद्याधरी, विलास प्रभृति अनेक करण ग्रन्थक प्रचलन्न ।

16 History and Culture of Indian People, Vol. 5, Bombay, 1966, edited by R. C. Mazumdar and others, p. 325.

17 cf. R. Jha, Maithilī Sāhityaka Ādikālā, Patna, 1968, p. 94 and also Avahaṭṭa, 1975, pp. 75ff.

However, unless further information is forthcoming, no last word can be said regarding authors of these texts.

Halāyudha

Jyotirīśvara, thereafter presents a list of phala granthas viz., Rājamārtaṇḍa, Halāyudha, Varāhamihara, Śrīpati Saṁhitā, Nanda Saṁhitā, Devala Saṁhitā and Candra Saṁhitā.[18] Rājamārtaṇḍa of Rājā Bhoja of Dhāra (1000–1055), (Bṛhat saṁhitā) of Varāhamihira (a versatile genius of the early 6th century) and Ratnamālā Saṁhitā of Śrīpati (c. 1039 A. D.) were some of the standard Saṁhitā granthas which were popular in Mithilā. According to Jyotirīśavara Halāyudha, too, was an author of a Saṁhitā grantha. It is now almost certain that Halāyudha is a Maithila scholar. Pt. Baladeo Mishra has given a number of evidences in this respect and has established the fact that Halāyudha's dynasty continued in Mithilā for a long time and produced a chain of great scholars from Vararuchi to Padmanābha.[19] Halāyudha had been in the courts of the King of Sena dynasty and was popular as a lexicon writer. Abhidhāna-Ratnamālā, a lexicon work and Brāhmaṇa Sarvasva, a treatise on Dharma Sāstra dealing with Karmakāṇḍa are some of his important works. In Varṇa–Ratnākara he is mentioned as an astronomer and an author of an astronomical text, but these days the work is not available. It is believed that Lakṣmīdhara Bhaṭṭa, Caṇḍeśvarācārya, Harinātha, Raghunandana Miśra and others have either mentioned his name or quoted him[20]. Lakṣmīdhara Bhaṭṭa was the prime minister of Govindacandra (1114–1115 A.D.) of Kāśī, the grand father of Jayachandra[21]. Hence it may be concluded that Halāyudha must have flourished before Lakṣmīdhara, i.e., in the latter part of the 11th century. Thus it seems that his astronomical text written in the 11th century, was popular in Mithilā even in the 13th or 14th century but no mention is made about the work after Jyotirīśvara.

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18 Varṇa–Ratnākara, p.23–राजमार्तण्ड हलायुध वराहमिहिर श्रीपतिसंहिता नन्दसंहिता. देवलसंहिता चन्द्रसंहिता ई अनेक फलग्रन्थक बहुतर ।

19 Mithilā Mihira, Mithilāṅka, V. S. 1992, p. 22–24.

20 History and Culture of Indian People, Vol. 5, p. 331 and 334.

Nothing definite is known about Nanda Saṁhitā, Devala Saṁhitā and Chandra Saṁhitā. This much seems to be certain that Nanda, Devala[22] and Candra were astronomers and authors of some astronomical texts. Due to unavailability of Mss. of their works it is not possible to ascertain whether they belonged to Mithilā or some other parts of India.

Different aspect of calendar-making, viz., Thithi, Vāra, Nakṣatra, Yoga and Karaṇa and units of time[23] prevalent those days in Mithilā are also mentioned by Jyotirīśvara. All these informations make us believe that almost all essential aspect of astronomy were in vogue in the land of Mithilā during the time of Jyotirīśvara and Maithila scholars were interested in this branch of knowledge. This is the sacred duty of scholars to trace out the Mss. of the lost astronomioal works so that the achievements of Maithila scholars may be assessed correctly in the science of astronomy.

Bhaveśa

Bhaveśa (c. 13th century) composed two works on astronomy, viz., (i) Jātakapaddhatigaṇitodāharaṇaṃ,[24] a commentary on the Jātaka-paddhati of Śrīpati and (ii) Līlāvatī-Vyākhyā,[25] a commentary on Līlāvatī, a work on mathematics by Bhāskarācārya (b. 1114 A.D.). It appears from the post colophon of the former that the Mss. belonged to Ṭhākura family whose ancestor was Rosan Ṭhākura and for his sake the commentary was written by Bhaveśa. Moreover, the date of composition of this work is mentioned as Śaka 1185 i.e. 1263 A.D. and thus Bhaveśa may be placed in the category of the writers of 13th century A.D.

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21 Rājanīti Ratnākara of Caṇḍeśvara, edited by K.P. Jayaswal. Introduction, p. 28.

22 Devala is mentioned in the Varāha Saṃhitā & also in Adbhuta Sāgara of Ballālasena. Whether he is the same Devala is not certain. cf. S.B. Dikshit, op.cit., p. 453 and also S. Dvivedi, op. cit., p. 42.

23 Varṇa-Ratnākara, p. 24—[illegible] ॥

24 Des. Cata. of Mss. in Mithilā; vol. III. p. 205 and 445.

25 Ibid, p. 382. In the catalogue of Rāj. Mss. Darabhangā (p. 70-77) we have a reference of Līlāvatī-Ṭippaṇaṃ by Bhaveśa. Probably these two are one and the same work.

Vidyāpati

The great poet Vidyāpati is supposed to be an able and discriminate scholar of Purāṇas and Smṛties. A number of works have been written by him in Sanskrit. He has composed two works on Jyotiṣa also, viz., Jyotiṣa Darpaṇa[26] and Varṣakṛtya. The former deals with the principles of Jyotiṣa while the latter contains various customs and ceremonies of a householder throughout the year. The Mss. of the former is not available at present and hence nothing definite about its contents may be said.

Harapati Ṭhākura

Harapati, the eldest son of Vidyāpati, wrote Vyavahāra Pradīpikā (Jātaka)[27], a manual of Jyotiṣa-Śāstra. In this work he calls himself as Mudrāhastaka (keeper of the royal seal) and explains difficult lines by giving equivalent Maithilī verses. He has quoted even Dāka in this work for the proof of his statement[28]. Mss. of Vyavahāra Pradīpikā is still preserved in the Sankrit University Library, Darbhangā[29].

Haradatta Ṭhākura

Haradatta Ṭhakura of Visaivāra family of Saurāṭha flourished after Vidyāpati and was probably the last paṇḍita of that family. Haradatta, according to the geneology of Vidyāpati as presented by Dr. J. K. Mishra,[30] was the fifth son of Devāditya, the great-great grandfather of Vidyāpati. Whether he is the same Haradatta or some one else is not certain. This much is definite that Haradatta is the writer of two astronomical works, viz, Gaṇitanāma mālā[31] and Daivajña Bāndhava.[32] Daivajña Bāndhava seems to be very popular as 19 copies of its Mss. have been found in different parts of Mithilā[33].

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26. P. Jha, op. cit., 182.
27 Des. Cat. of Mss in Mithilā, III, p. 419.
28 [illegible]
29 Des. Cat. of Raj Mss. Darabhangā, p. 70–77.
30 cf. History of Maithili Literature, Allahabad, 1949, p. 137.
31 Des. Cat. of Mss. in Mithilā, III, p. 43.
32 Idid p. 169.
33 Ibid, pp. 169–75.

Madhusūdana :

Madhusūdana was the author of Jyotiṣa-Pradipāṅkura and Bhava Prakāśa, two manuals of Jyotiṣa-Śāstra.[34] He was the son of Narasiṁha and grandson of Nāgeśvara of the family of Māndara and has three brothers, Govinda, Narahari and Vāmadeva. He wrote his astronomical work, Jyotiṣa-Pradipāṅkura under the patronage of the king Dhira Siṁha (throned in 1460) of Oinavāra dynasty[35] and he, therefore, lived in the fir t half of the 15th century. We know several Madhusūdanas in medieval Mithilā[36] but Madhusūdana who was a noted scholar of astronomy and wrote these two astronomical works was of the 15th century.

MM. Sudhākara :

Mm. Sudhākara, son of Racikara was a versatile scholar. He was well versed in Nyāya and Vyākaraṇa and was also at home in Jyotiṣa. He wrote an astronomical treatise Ratnāvali[37] under the patronage of the king Narsiṁha-deva (died in c. 1460-62) of Oinavāra dynasty. This work had been very much popular among the scholars since its comosition. Latter Maithila scholars, viz., Vācaspati Miśra, the younger and others have quoted some verses from this work[38] and Pradyumna, a direct disciple of Mm. Sudhākara wrote a commentary on it namely Ratnāvali-Ṭīkā which is still preserved in the Sanskrit University Library, Darabhaṅgā[39].

Makaranda (c. 1438) :

Makaranda in 1478 A.D. prepared a table dealing with all elements relating to calendar-making at Kāśī. This is based on the famous astronomical text Sūrya-Siddhānta. A number of commentaries have been written on it by scholars of repute, viz., Divākara Daivajña, Viśvanātha, Gokulanātha,

34 Ibid., pp. 274–75 and also cf. T.N. Mishra, Mithilā-Mihira, Mathilāṅka, p. 95.

35 cf. History of Maithili Literature, Allahabad, p. 213.

36 Ibid, pp. 212–13.

37 P. Jha, op. cit., p. 174 and U. Thakur, op. cit., p. 327.

38 P. Jha, op. cit., p. 174.

39 Ibid and also, Des. Cat. of Raj Mss. Darabhaṅgā, pp. 70–77.

Raghubiradatta and others. It has been translated in English by Bentley.[40] This table has been popular all over India and is still prevalent in the land of Mithilā. This is not certain whether he belonged to Mithilā or to other part of India.

Vācaspati Miśra, the younger :

Vācaspati Miśra, the younger, 'the crest-Jewel among scholars' and the son-in-law of Bhairava Siṁha (throned in 1490 A. D.) of Oinavāra dynasty flourished in the latter part of the 15th century. He was a profound scholar of Vyākaraṇa, Nyāya, Mīmāṁsā and Dharmaśāstra and was also an eminent astronomer. He wrote a book Tithi-Nirṇaya on Jyotiṣa[41] and quoted some verses from the Ratnāvalī of Mm. Sudhākara for the proof of his statements regarding Samaya-Śuddhi in his reputed works Kṛtya-Cintāmaṇi and Dvaitya-Nirṇaya[42] on Dharmaśāstra.

Pakṣadhara Miśra (Jayadeva) :

Pakṣadhara Miśra lived in the court of Rājā Bhairava Siṁha of Oinavāra dynasty and was a contemporary of the great poet Vidyāpati. He wrote two astronomical treatises namely Līlāvatī-viveka[43] and Tithi-candrikā.[44] The former is a commentary on Līlāvatī, a mathematical work of Bhāskarācārya (b. 1114 A.D.) and the latter is his original work on Jyotiṣa. His third work Tithi-Nirṇayacandraḥ is a hand book on Dharmaśāstra dealing with Tithi-Vicāra[45] Śiśu-Bodha, a manual of Jyotiṣa-Śāstra dealing with the calculation of Yātrā, Vrata-Bandha etc., is also ascribed to the authorship of Pakṣadhara[46] but it is not certain whether he is the same Pakṣadhara or some one else.

40 S. B. Dikshit, op. cit., p. 208 and S. Dvivedi, op. cit., pp. 52-53.
41 cf. R. R. Diwākara, Bihar Through the Ages, 1959, Bombay, p. 439.
42 P. Jha, op. cit., p. 174.
43 Bihar Through the Ages, p. 413.
44 U. Thakur, op. cit., p. 333.
45 Des. Cat. of Mss. in Mithilā, I, p. 175.
46 Des Cat. of Mss. in Mithilā, III, p. 430.

Lakṣmīdāsa Miśra

Lakṣmīdāsa Miśra, son of Vācaspati Miśra wrote probably in the year 1500 A.D. (śaka 1422) a commentary Gaṇita-tattva-Cintāmaṇi[47] on the Siddhānta-Śiromaṇi of Bhāskarācārya (b. 1114 A.D.). He has illustrated the principles with several examples and also established the rationale of various rules as propounded by Bhāskarācārya. Thus this commentary is supposed to be a standard work on astronomy. Śaka 1420 has been used in an example for the eclipse and Śaka 1422 has been taken as the calculating year and hence it may be inferred that he flourished in the latter part of the 15th century.

Vibhākarācārya

Vibhākarācārya wrote a book on astronomy namely Praśna Kaumudī[48] which is a short treatise in verse on astrological query and is an original work. He was a court Paṇḍita of a Maithila King Rāmabhadradeva of Oinavāra family who reigned in L. S. 395.

Besides the above mentioned astronomers there are a number of scholars of Mithilā who either wrote original astronomical texts or composed commentaries on standard works but their dates and personal details are almost entirely unknown. Again there are texts on astronomy which are found to be written by anonymous writers.[49] Hence there is the need for researches in this regard so that the extensive Jyotiṣa literature produced in Mithilā during the period under consideration may be brought to light. However, on the basis of the materials available so far it may be safely said that Jyotiṣaśāstra has been a favourite of Maithila scholars from very early times and a large number of astronomical texts, big and small, original as well as commentative have been written by them during the period ranging from the 10th century A.D. to 15th century.

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47 Ibid pp. 38–42.

48 Ibid, p. 211.

49 From the Index of authors (Des. Cat. of Mss. in Mithilā–p. XVII to XXI) we are able to know that as many as 121 works on astronomy out of 437 (found in Mithilā) are of anonymous authors.

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